CLAIMS:

1. An elastomeric gasket adapted to seal a flow field plate, a gas diffusion layer and an ion-exchange polymer membrane in a fuel cell stack, said gasket comprising:

a carrier member having one side and an opposite side; and

an elastomeric member on said one side of said carrier member, said elastomeric member having a base, a sealing portion on said base, and an adhesive layer on said opposite side whereby said adhesive layer is disposed adjacent to the ion-exchange polymer membrane, the gas diffusion layer is adjacent to said tab portion and said sealing portion is disposed adjacent to the flow field plate.

2. A gasket as claimed in Claim 1 wherein said elastomeric member is selected from the group consisting of EPDM, polyacrylate, fluorocarbon, silicone, epichlorohydrin, fluorosilicone, fluoropolymer, butyl, nitrile, hydrogenated nitrile, thermoplastic elastomer, and thermoplastic vulcanizate.

3. A gasket as claimed in Claim 1 wherein said tab portion is disposed adjacent to the gas diffusion layer and said adhesive layer is adhesively connected to the ion-exchange member and the gas diffusion layer.

4. A gasket as claimed in Claim 2 where said sealing portion having a sealing bead, said sealing bead having an apex above said base, said apex having a height H_2 between said apex and said base, said apex being compressed into said base portion up to 100% of said height H_2.

5. A gasket as claimed in Claim 1 wherein said carrier is selected from a polymeric material consisting of Nylon, Mylar, Kapton, polybutylene terephthalate, polyethylene naphthalate, and polyethylene terephthalate.

6. A gasket as claimed in Claim 1 wherein said carrier is selected from a polymeric material consisting of polyester, polyamide, silicone, polyimide, and polyethersulphone.

7. A gasket as claimed in Claim 1 wherein said carrier is selected from a metallic material consisting of steel, brass, aluminum, magnesium, stainless steel, and a rubber coated metal layer.

8. A gasket as claimed in Claim 1 wherein said carrier is selected from a group consisting of a gas diffusion layer, a plastic plate, a graphite plate, an ion-exchange polymer membrane, a non woven layer, a fiber board, a woven fabric, and a ceramic layer.

9. A gasket as claimed in Claim 1 wherein said carrier having a thickness, said thickness is less than 1.0mm.

10. A gasket as claimed in Claim 1 wherein said carrier having a thickness between 0.005 to 0.95mm.

11. An elastomeric gasket adapted to seal a fuel cell, the fuel cell including a pair of flow field plates, a pair of gas diffusion layers and an ion-exchange polymer membrane, said gasket comprising:

a first carrier member having a first side and an opposite;

a first elastomeric member on said first carrier member, said first elastomeric member having a first tab portion and a first base portion adjacent to said first tab portion;

a first adhesive layer on said opposite side of said first carrier member;

a second carrier member having one side, an opposite other side and a second perimeter web portion;

a second elastomeric member on said second carrier member, said second elastomeric member having a second tab portion and a second base portion adjacent to said second tab portion; and

a second adhesive layer on said other side of said second carrier

whereby said first adhesive layer on said first carrier is adjacent to one side of said ion-exchange polymer member and said second adhesive layer on said second carrier is adjacent to the other side of said ion-exchange polymer member, one of the pair of gas diffusion layers is adjacent to said first tab portion and the other of said pair of gas diffusion layers is adjacent to said second tab portion and said first sealing portion is adjacent to one of said pair of flow field plates and said second sealing portion is adjacent to the other of said pair of flow field plates.

12. A gasket as claimed in Claim 11 wherein said first tab portion having a mechanically engaging portion, said mechanically engaging portion having an exterior shape selected from the group consisting of a partial square, a partial triangle, a partial arcuate and a partial polygonal shape.

13. A gasket as claimed in Claim 11 wherein said first carrier member having a first perimeter web portion interposed said first adhesive layer and said first elastomeric member.

14. A gasket as claimed in Claim 11 wherein said first sealing portion having a sealing bead, said sealing bead having an apex, said apex having a height H_2, between said apex and said base, said apex being compressed into said base portion up to 100% of said height H_2.

15. A gasket as claimed in Claim 11 wherein said first tab portion adhesively engages one of the pair of the gas diffusion layers and the ion-exchange polymer member.

16. A gasket as claimed in Claim 11 wherein said first carrier member is selected from a polymeric material consisting of Nylon, Mylar, Kapton, polybutylene terephthalate, polyethylene naphthalate, and polyethylene terephthalate.

17. A gasket as claimed in Claim 11 wherein said first carrier member is selected from a polymeric material consisting of polyester, polyamide, silicone, polyimide, and polyethersulphone.

18. A gasket as claimed in Claim 11 wherein said first carrier member having a thickness between 0.005 to 0.95mm.

19. A gasket as claimed in Claim 14 wherein said sealing bead having a shape factor between 0.1 to 100.

20. A method of forming an elastomeric gasket to seal a flow field plate, a gas diffusion layer and an ion-exchange polymer member, said method comprising:

applying an adhesive layer on one side of a carrier, said carrier having a thickness less than 1.0mm; and

forming an elastomeric member on the other side of said carrier, said elastomeric member having a sealing bead, said sealing bead having a shape factor, said shape factor is between 0.1 to 100.

21. A method as claimed in Claim 20 further comprising;

orienting the ion-exchange polymer member and said gas diffusion layer relative to said adhesive layer so as to bond said adhesive layer to the ion-exchange polymer and to the gas diffusion layer.

22. A method as claimed in Claim 20 further comprising:

forming a tab portion in said elastomeric member; and

placing said tab portion on the gas diffusion layer so that said tab portion overlays the gas diffusion layer and said sealing bead is adjacent to the flow field plate to form a high line sealing pressure on the plate.

23. A method as claimed in Claim 20 wherein said sealing portion having a base, said base having a first height H_1 above said one side of said carrier and said sealing bead having an apex, said apex forming a second height H_2 above said base.

24. A method as claimed in Claim 20 wherein said height H_1 and said height H_2 are less than 1.0mm.

25. A method as claimed in Claim 20 wherein said thickness of said carrier is between 0.005 to 0.95mm.

26. A method as claimed in Claim 20 wherein said carrier is made of a material selected from a group consisting of nylon, Mylar, Kapton, PBT, PEN, and PET.

27. A method as claimed in Claim 20 further comprising:

die cutting said elastomeric member on said carrier.

28. A method as claimed in Claim 20 wherein said forming step is selected from the group consisting of depositing, injecting, transferring, forming in place, applying by roll coating and screen printing.

29. A gasket adapted for sealing a joint between a first member and a second member, said gasket comprising;

a carrier member having a first side and an opposite side, said carrier member having a thickness, said thickness being between 0.03 to 0.95mm.

an elastomeric member on said carrier member, said elastomeric member having a base portion on said first side of said carrier member; and

an adhesive layer on said opposite side of said carrier member

whereby said carrier adhesively adhering to one of the first and second members and forming a seal between the first member and the second member and said carrier member being conformable.

30. A gasket as claimed in Claim 29 where said sealing portion having a sealing bead, said sealing bead having a shape selected from the group consisting of a triangle, rectangle, square, polygonal, semi-elliptical, oval, semi-round, and truncated triangle.

31. A gasket as claimed in Claim 29 wherein said carrier is selected from a polymeric material consisting of Nylon, Mylar, Kapton, polybutylene terephthalate, polyethylene naphthalate, and polyethylene terephthalate.

32. A gasket as claimed in Claim 29 wherein said carrier is selected from a polymeric material consisting of polyester, polyamide, silicone, polyimide, and polyethersulphone.

33. A gasket as claimed in Claim 29 wherein said carrier is selected from a metallic material consisting of steel, brass, aluminum, magnesium, stainless steel, and a rubber coated metal layer.

34. A gasket as claimed in Claim 29 wherein said elastomeric member having a tab portion, said tab portion having a first height H_1 above said first side and said sealing portion having a second height H_2 that is above said base portion that is greater than said first height H_1.

35. A gasket as claimed in Claim 29 wherein said carrier is selected from the group consisting of a plastic plate, a graphite plate, a non woven layer, a fiber board, a woven fabric, and a ceramic layer.

36. A gasket as claimed in Claim 29 wherein said base portion and said tab portion having a sealing bead, said sealing bead having a shape to form a high line sealing pressure on one of the first and second members.

37. A gasket as claimed in Claim 34 wherein said tab portion having a mechanical engaging portion and an adhesive engaging portion.

38. A gasket as claimed in Claim 36 wherein said sealing bead having a shape factor between 0.1 to 100.

39. A gasket as claimed in Claim 37 wherein said mechanical engaging portion having a shape, said shape selected from a group consisting of a partial square, a partial triangle, a partial arcuate and a partial polygonal shape.

40. A gasket as claimed in Claim 24 wherein said sealing bead having a shape factor between 0.1 to 100.

41. A gasket as claimed in Claim 36 wherein said sealing bead having an apex, said apex being compressed into said base portion up to 100% of the height of said apex.

42. A gasket as claimed in Claim 41 wherein said apex is compressed by 100% of the height to form a compression limiter, said compression limiter having a shape factor between 0.1 to 100.

43. A gasket as claimed in Claim 41 wherein said shape factor is between 0.15 to 10.

44. A gasket as claimed in Claim 41 wherein said shape factor is between 0.2 to 10.

45. A gasket as claimed in Claim 29 wherein said adhesive layer is a pressure sensitive adhesive.

46. A gasket as claimed in Claim 29 wherein said elastomeric member is made of a material selected from a conventional elastomer and a self-bonding elastomer.

47. A gasket as claimed in Claim 29 wherein said elastomer is a reaction cured material selected from addition-ion, catalytic, ultraviolet, infrared radiation, condensation and free radical.

48. A gasket as claimed in Claim 29 wherein said pressure sensitive adhesive is selected from the group consisting of silicone based, acrylic based, butyl based, polyvinyl acetate based and polyether silicone based.

49. A gasket as claimed in Claim 29 wherein said elastomeric member is made of a polymer selected from the group consisting of silicone, fluorosilicone, butyl, fluorocarbon, ethylene acrylate, polyacrylate, fluoropolymer, isoprene, epichlorohydrin, EPDM, nitrile, HNBR, TPE and TPV.

50. A gasket as claimed in Claim 29 wherein said elastomeric member is made from a self-bonding elastomer, said self-bonding elastomer selected from the group consisting of silicone, fluorosilicone, butyl, fluorocarbon, ethylene acrylate, polyacrylate, fluoropolymer, isoprene, epichlorohydrin, nitrile, EPDM, HNBR.